

PCE Americas Inc.
711 Commerce Way
Suite 8
Jupiter
FL-33458
USA
From outside US: +1
Tel: (561) 320-9162
Fax: (561) 320-9176
info@pce-americas.com

PCE Instruments UK Ltd.
Units 12/13
Southpoint Business Park
Ensign way
Hampshire / Southampton
United Kingdom, SO31 4RF
From outside UK: +44
Tel: (0) 2380 98703 0
Fax: (0) 2380 98703 9
info@pce-instruments.com

www.pce-instruments.com/english
www.pce-instruments.com

User manual Hygrometer PCE-HMM



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1 Introduction

Thank you for choosing an AGRETO hay moisture meter. You have got a robust tool for daily practice. Please read this manual carefully before operating the unit.

2 Scope of delivery

- 1 meter 50 cm measuring lance (or 100/270 cm depending on model)
- 1 battery 9V
- 1 packaging box
- 1 user manual

3 Intended use

The HFM II AGRETO hay- & straw moisture meter is designed for measurement of moisture and temperature in compressed hay bales (square bales, round bales and large bales) by inserting the probe into the bale at right angles.

To obtain meaningful values, the measurement at several points in the ball must be carried out, and an average can be formed.

In practice it is usually not an exact moisture percentage, but a review of the barrel in terms of quality and storability. The higher values in the ball must be given priority.

Not pressed material must be compressed before measurement in a suitable form, for example by compressing in a bucket.

To measure the temperature the probe must remain in the material until a constant temperature is displayed.

User information:

- Store the device on a dry place.
- Do not immerse the probe in water!
- Make sure that the lance is not tilted or bent during insertion. This is especially true for the long lances (100/270 cm).

4 Security

4.1 Safety instructions for the buyer



Important!

Make sure that each person who works for the first time with the AGRETO HFM II, has read and understood this manual.



Danger!

Make sure that the AGRETO HFM II is kept in a place that is not accessible to unauthorized persons.

4.2 Safety instructions for the operator



Danger!

The AGRETO HFM II may only be operated by persons who are familiar with the operation of the device.



Precaution!

Keep the work area clean! Soiled areas contributes to accidents.

4.3 Personal protective equipment



WARNING!

For people who work with the device, the wearing of safety gloves is required.



WARNING!

For people who work with the device, the wearing of safety shoes is required.

4.4 Residual hazards

Working with the device residual risks may arise for persons and objects that cannot be prevented by design or technical protection measures.



Danger!

During the handling of the device there may be a risk of injuries because of the pointed measuring lance tip.



WARNING!

The AGRETO HFM II must not be operated in the area of live parts and wiring. There is a risk of electric shock!



WARNING!

The AGRETO HFM II must not be operated in explosive areas.

5 Technical Specifications

- Box dimensions: 800x78x54 mm (LxWxH) (version with 50 cm lance)
- Device dim: 772x70x48 mm (LxWxH) (version with 50 cm lance)
- Weight incl. battery: 650 g (version with 50 cm lance)
- Stainless steel lance with plunge length 50 cm (50 cm version)
- Dust-and splash-resistant housing
- Stable, ergonomically shaped wooden handle
- Keypad with 4 keys
- LCD display with 15mm high digits
- Moisture range 9-50%
- Temperature range -10 bis 100°C
- Resolution of the display 0,1%; Accuracy 0,8%
- Ongoing display of the measured value during the measurement procedure for the rapid determination of moisture content at various points in bales
- Hold-function; Count-function; Average-function
- Display the battery voltage
- Automatic backlight
- Automatic shutdown
- Automatic calibration
- Power supply by 9V battery

6 Commissioning

When supplied, the supplied battery is disconnected. Open the battery compartment, connect the battery and close the battery compartment.

7 Working with the device

7.1 Keypad



7.2 Switching on the device

The device does not have a power button. It automatically turns on when you press one of the [Temperature] or [Moisture] button.

7.3 Making Measurements

Once the device is turned on continuously (2x per second) either moisture or temperature values are displayed depending on the selected mode. The current display is signalled by the flashing decimal point, the displayed values are of course only meaningful if the probe is in the material.

To change the mode, press the button briefly [Moisture] or the [Temperature]

To carry out moisture measurements, proceed as follows:

- Penetrate the probe on one of the side surfaces of the bale.
- With the current display you can already read the measured value during the slow penetrating. When pulling out the lance, the values are not meaningful.
- Moisture values are displayed between 9-50%.
- Moisture values below 9% are displayed as „L“.
- At moisture values over 50 the display flashes with the message „H“
- Repeat the measurement at different places in the bale to obtain a better overview of the situation in bales.
- The display lighting switches off after 20 seconds without pressing any keys automatically. To enable it again, press the [moisture] or [temperature] key.
- The unit itself switches off after 2 minutes without pressing any key automatically. To turn on again, press the [moisture] or [temperature] key.
- If "LoBat" appears on the display, the battery voltage is below 8 volts and the battery should be replaced.

To carry out temperature measurements, proceed as follows:

- Insert the probe on one of the side surfaces of the bale and read the display.
- Wait until the temperature is stable, it can take up to several minutes. Read the value only, when the display shows a steady value.
- Note that the lance can warm up itself by repeatedly piercing. Allow it to cool down before you make further measurements.
- Temperature values are displayed between 0 and 100 ° C.
- Repeat the measurement at different places in the bale to obtain a better overview of the situation in bales.

7.4 Freezing of displayed values (Hold function)

If you cannot see the display while the moisture measurement, for example if you measure a bale on a trailer, you can freeze the currently displayed moisture

value for 5 seconds by pressing the [moisture] key. During this time, the current display is frozen and displayed and the held value is displayed with a non-flashing decimal point. Then the device starts again with the automatic display of the current measured value.

7.5 Forming averages

To form an average of several measurements of moisture, or to count the number of measurements, proceed as follows:

- Perform the initial measurement.
- When the reading on the display is stable, press the button briefly [Summing]. The displayed value is written to memory. On the display the number of measurements that are already in memory appears for 5 seconds. Then the unit will return to the automatic display of the moisture.
- Repeat the process as many times as you like with different measurements or measurements of several bales.

7.6 Retrieving the average value

To display the average of the stored measurements, proceed as follows:

- Press and hold the [Moisture] - key for about 3 seconds.
- The average moisture value of all stored measured values appear on the display. This value will flash alternating with the message "A".
- The total memory is not cleared.
- To return to the current display, press the [Moisture] key.

To write the current measured value in the total memory and then immediately display the number and the average follow these steps:

- Perform the measurement to be written into the accumulator. While the measured value appears on the display press and hold the [Summing] key for about 3 seconds.
- On the display appears for about 2 seconds the number of readings which are in total memory.
- Then the average value from all stored moisture measured values appears. This value will flash alternating with the message "A".
- The total memory is not cleared.

-
- To return to the current display, press the [Moisture] key.

7.7 Deleting the total memory

To delete the total memory manually turn the device off and on again.
After automatic turn off the total memory is not cleared.

7.8 Display of Battery Voltage

To display the battery voltage, briefly press the button [OFF]. The battery voltage in Volts Appears on the display for about 3 seconds. The unit automatically switches back to the current display mode.

7.9 How to switch off the device

After 2 minutes without any key operation, the device switches off automatically.
To turn off the device manually press and hold the [OFF] key for about 3 seconds. When you turn off manually the total memory is erased.

8 Factors influencing moisture testing

8.1 Bale density

Hay and straw bales are of different density. In practice, the bale density may usually not be determined. In addition, the density within a bale can be very different, intentionally or unintentionally.

The calibration of AGRETO HFM II is designed for an average bale density. In bales with higher density a higher moisture level will tend to appear and at lower density bales a lower value will be displayed. This fact is advantageous in practice in many cases, because, with higher density bales increased sensitivity is advised with respect to quality and storability.

8.2 Material

A hay or straw bale consists of various plant parts drying unevenly. Also, the material in the bale is not always stored uniformly. The leaf / stem ratio is not always the same in the entire bale.

Accordingly, the moisture inside a bale is different. Bales with higher moisture typically have higher moisture differences within the bale. With increasing drying the differences become smaller.

The AGRETO HFM II measures the moisture and the temperature only in the region of the material that rests directly around the tip of the device.

8.3 Sweating

In the first days after the pressing, the moisture value can rise slightly. In marginal bales you should constantly perform control measurements these days.

8.4 Preservatives

Some preservatives change the electrical properties of the material. In the period in which the preservative is added, it may lead to an increased moisture value for several days to a few percentage points.

9 Cleaning and maintenance

- Clean the tip and the lance of the instrument before the season and when visibly soiled with fine steel wool and / or alcohol.
- Store the device on a dry and clean place.
- If you are not using the unit for a long time, it is advisable to disconnect the battery.

10 Troubleshooting

10.1 Battery is empty

If the device display the text "LoBat" the battery needs to be replaced. Any displayed measurement values can be wrong.

10.2 Wrong measurement values

If you think the displayed measurement values are not correct proceed as follows:

- Note the information in the section "Factors influencing moisture measurements"
- Note the fact that even in dry bales moist areas may occur and / or locations with higher temperature.
- Make sure that the tip and the probe are dry. In the initial state on the display "L" must appear. If a value is displayed without insertion of the lance, then the tip is not dry.
- Make sure that the tip and the lance are not contaminated.
- For temperature measurements, note that the probe must remain in the material as long as the temperature display does not change.

10.3 Damages on the device

- Please contact the manufacturer or your dealer

11 Warranty

For this device, the warranty period is 2 years from date of purchase. This warranty does not cover damage due to improper use, misuse or damage from the outside.

12 Disposal



Dispose of the HFM II in the definitive shutdown or parts of environmentally friendly (metal to the respective metal scrap, plastic to plastic waste, etc. - Do not dispose as household waste!) Detailed information can be found in Directive 2002/96/EC.

14 Imprint

All information, specifications and illustrations are as of 2014, subject to technical changes or design changes.

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